

(18) $T(n) = 6T(n/3) + n^2 \log n$
 $a=6, b=3, K=2, P=1$

$$6 < 3^2 \quad \& \quad P > 0$$

$$T(n) = \Theta(n^2(\log n)^1)$$

$$T(n) = \Theta(n^2 \log n)$$

(20) $T(n) = 64T(n/8) - n^2 \log n$
 $a=64, b=8, K=2, P=1$

$$64 = 8^2 \quad \& \quad P > -1$$

$$T(n) = \Theta(n^{\log_{8}64} \cdot (\log n)^{1+1})$$

$$T(n) = \Theta(n^2(\log n)^2)$$

(21) $T(n) = 2T(n/3) + n^2$

$$a=2, b=3, R=2, P=0$$

$$2 < 3^2 \quad \& \quad P = 0$$

$$T(n) = \Theta(n^2(\log n)^0)$$

$$\textcircled{14} \quad T(n) = 3T(n/3) + dn$$

$$O^* \approx T(n) = 3T(n/3) + n^{1/2}$$

$a=3, b=3, k=1/2, P=0$

$$3 > 3/2$$

$$T(n) \in \Theta(n(\log_3)^2)$$

$$T(n) \in \Theta(n)$$

$$\textcircled{15} \quad T(n) = 4T(n/2) + cn$$

$$a=4, b=2, k=1, P=0$$

$$4 > 2$$

$$T(n) \in \Theta(n \log_2^n)$$

$$T(n) \in \Theta(n^2)$$

$$\textcircled{16} \quad T(n) = 3T(n/4) + n \log n$$

$$a=3, b=4, k=1, P=1$$

$$3 < 4 \quad \text{but } P > 0$$

$$T(n) \in \Theta(n' (\log n')')$$

$$T(n) \in \Theta(n \log n)$$

$$\textcircled{17} \quad T(n) = 3T(n/3) + n/2$$

$$T(n) = \Theta(n^{0.51} / (\log n)^6)$$

$$T(n) = \Theta(\sqrt{n})$$

⑨ $T(n) = 0.5T(n/2) + 1/n$

$$T(n) = 0.5T(n/2) + n^{-1}$$

$$a=0.5, b=2, K=-1, P=0$$

$$0.5 = 2^{-1} (0.5 = \frac{1}{2})$$

$$P=0$$

$$T(n) = \Theta(n^{\log_2 0.5} \cdot (\log n)^1)$$

$$T(n) = \Theta(n^{(\log 1)})$$

⑩ $T(n) = 16T(n/4) + n^1$

Not applicable.

⑪ $T(n) = 4T(n/2) + \log n$

$$a=4, b=2, K=0, P=1$$

$$4 > 2^0$$

$$4 > 1$$

$$T(n) = \Theta(n \log^{2^4})$$

$$T(n) = \Theta(n^2)$$

⑫ $T(n) = \sqrt{n} T(n/2) + \log_2$

Class $T(n) = 16 T(n/4) + n$
 $a=16, b=4, K=1, P=0$

$$16 > 4^1$$

$$T(n) = \Theta(n^{\log_4 16})$$

$$T(n) = \Theta(n^4)$$

$$T(n) = \Theta(n^2)$$

⑥ $T(n) = 2T(n/2) + n \log n$

$$a=2, b=2, R=1, P=1$$

$$2 = 2^1$$

$$4 \quad P > -1$$

$$T(n) = \Theta(n^{\log_2 2} \cdot (\log n)^2)$$

⑦ $T(n) = 2T(n/2) + n/\log n$

$$T(n) = 2T(n/2) + n(\log n)^{-1}$$

$$a=2, b=2, K=1, P=-1/2$$

$$2 = 2^1$$

$$P = -1$$

DAA Tutorial 4

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$$\textcircled{1} \quad T(n) = 3T(n/2) + n^2$$

$$a=3, b=2, k=2, P=0$$

$$3 < 2^2$$

$$3 < 4$$

$$P=0$$

$$T(n) = \Theta(n^2(\log n)^0)$$

$$T(n) = \Theta(n^2)$$

$$\textcircled{2} \quad T(n) = 4T(n/2) + n^2$$

$$a=4, b=2, k=2, P=0$$

$$4 > 2^2$$

$$4 = 4$$

$$P \rightarrow 1 \rightarrow$$

$$T(n) = \Theta(n^{\log_2 4} \cdot (\log n))$$

$$T(n) = \Theta(n^2 \log n)$$